# FI NAL REPORT DATA MANAGEMENT STUDY APPENDIX N

## CONTRACTOR DATA REQUIREMENTS SITE ACTIVATION FOR LAUNCH (AL)

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Data Management and Control Task

Voyager Spacecraft System Project

PREPARED FOR
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
NASA PASADENA OFFICE
PASADENA, CALIFORNIA

UNDER NASA CONTRACT No. NAS7-584



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#### INTRODUCTION

#### 1.1 DEFINITION - SITE ACTIVATION FOR LAUNCH (AL)

These data are those concerned only with the activation of sites for flight operations. Documents within this category cover the activities and requirements from facility availability to vehicle launch and identify organizations, locations, and responsibilities, including lines of control for the conduct of site activation, as well as any special tests and test support administration and logistics procedures and problems anticipated during site activation.

#### 1.2 SCOPE

Data items within this category would include, but not be limited to, those which identify organizations, responsibilities, locations, lines of control, site activation tests, site activation test support administration, special logistic procedure, and problems anticipated which are related to this activity.

Also, included are data items reflecting the contractor activities during launch operations, such as LCE installation and checkout, demonstrations, compatibility test participation and countdown operations. These data items will include items such as plans, procedures, sequence of events, launch criteria and constraints, and manuals.

DATA ITEM NUMBER	DATA ITEM SITE ACTIVATION FOR LAUNCH	DESCRIPTION
AL- 001	Plan, Site Activation	Includes plans for support during the Site Acti installation and checkout of LSE.
AL- 002	Plan, Launch Operations	Documents plans for support during the time of flight hardware for launch. Includes test flow
AL- 003	Plan, Range Safety	Documents technical data input to support the Safety.
AL- 004	Plan, Pad Safety	Documents safety conditions and procedures to and testing at the launch site.
AL- 005	Plan, Launch Site Program Requirements	Documents requirements for use of Government operations at the launch site and includes forest
AL- 006	Plan, Site Integrated Test	Provides integrated plans and procedures for launch site including EMI control and test plan Propellant Tanking Procedures and Countdown
AL- 007	Report, Site, Spacecraft Test and Launch	Documents results of spacecraft test and operaspacecraft Launch Report and a final Telemetr
AL- 008	Plan, Site Facilities Implementation	Documents plans for support operations during Management Plan, Joint Operating Procedure
AL- 009	Plan, Operational Requirements	Includes inputs to Launch Test Directive, Ope Document and Operations Directives.
AL- 010	*Report, Daily Operational Status	Documents status of spacecraft and associated site. Includes work planned and accomplished
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<sup>\*</sup> KEY INFORMAL DATA

### DATA ITEM LIST/USER MATRIX

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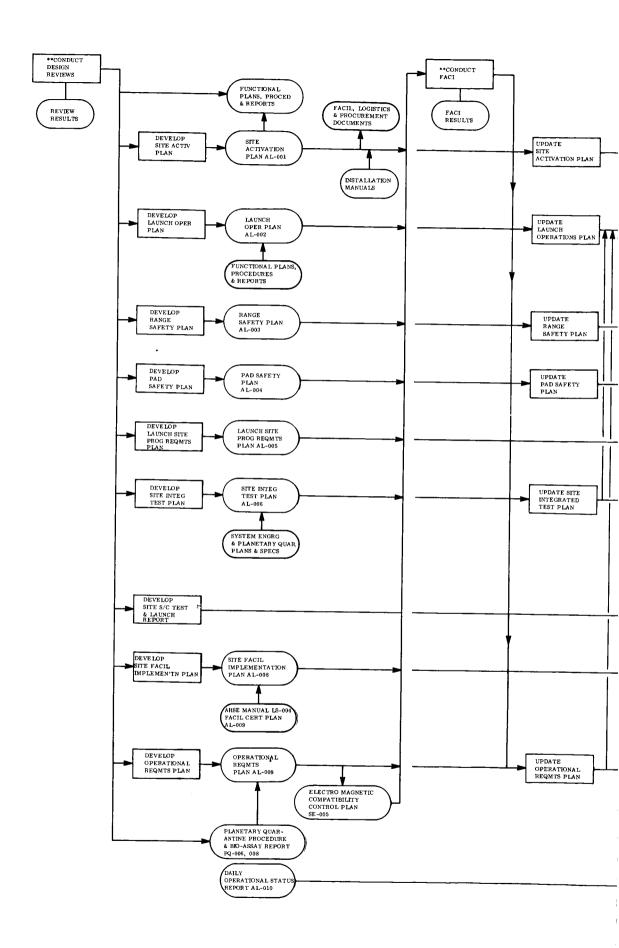
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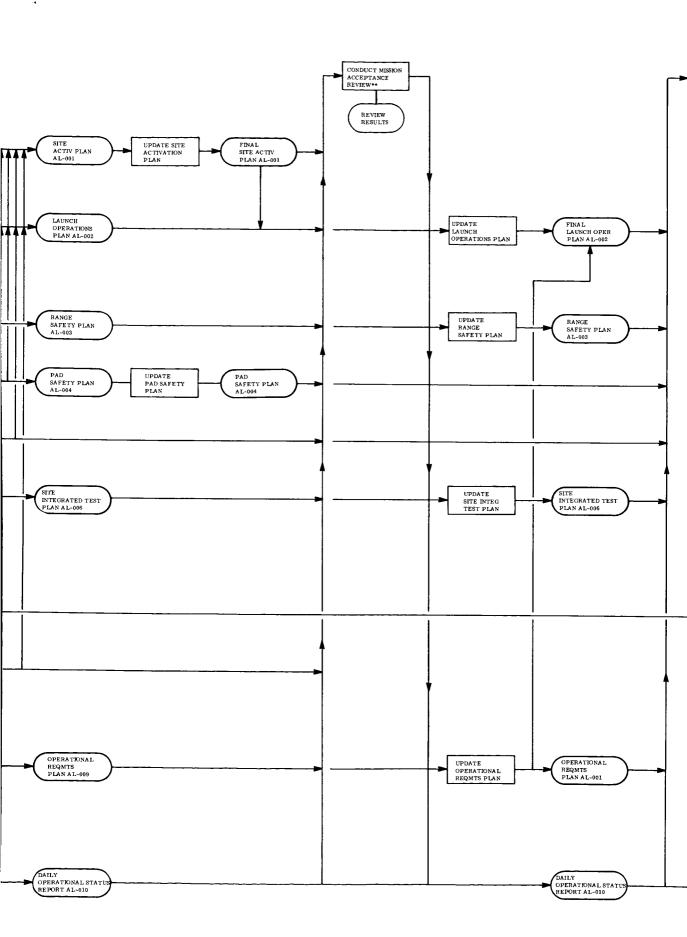
#### USER FLOW DIAGRAMS

Contractor - user flow diagrams show the relationship between Voyager system documentation and the activities undertaken by the prime spacecraft contractor. The diagrams are intended to be a communication tool which describes the project in terms which emphasize documentation and as a planning tool for the integration of data management activities into the overall project management scheme.

The project is considered in a generalized sense, in that subsystems and components are each treated as collective entities; that is, the documentation flows associated with the several separate subsystems are not distinguished. A single representative flow is presented.

The drawings show the detail activities and are keyed to the formal design and hardware reviews.





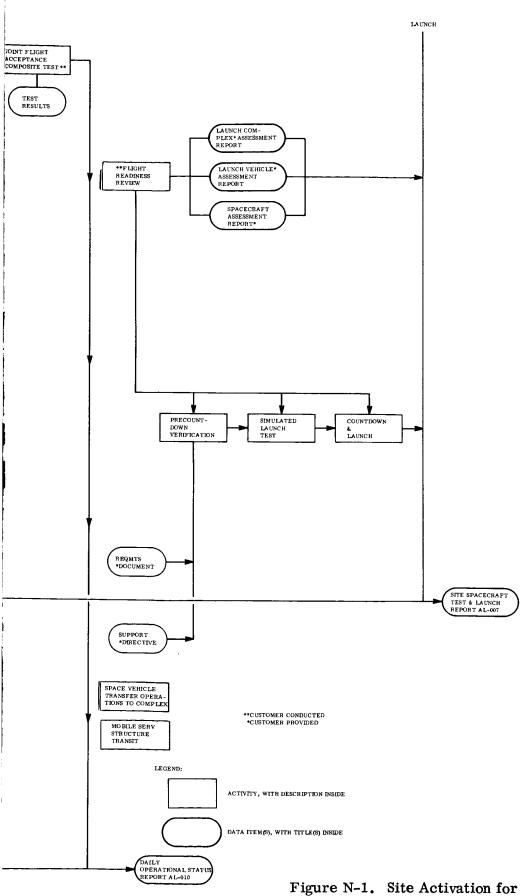


Figure N-1. Site Activation for Launch User Flow Diagram-Critical Design Review Through Launch

#### Site Activation for Launch Data Requirement Descriptions

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AL-001	Plan, Site Activation
AL-002	Plan, Launch Operations
AL-003	Plan, Range Safety
AL-004	Plan, Pad Safety
AL-005	Plan, Launch Site Program Requirements
AL-006	Plan, Site Integrated Test
AL-007	Report, Site, Spacecraft Test and Launch
AL-008	Plan, Site Facilities Implementation
AL-009	Plan, Operational Requirements
AL-010	*Report, Daily Operational Status

<sup>\*</sup>Key Informal Data

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(4) Range support equipment	
(5) Launch complex	
(6) Mission operations system	
(7) Deep space network	
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#### OUTLINE OF CONTENTS:

- 1. Introduction
- 2. Scope and applicable documents
  - a. Policies and responsibilities
- 3. Spacecraft operations
  - a. Ground systems test flow plan
    - (1) Transportation and handling
    - (2) System tests
    - (3) Interface tests
    - (4) Combined systems test
  - b. Space vehicle tests
    - (1) Transportation and handling
    - (2) Mating to launch vehicle
    - (3) Integrated S/C L/V tests
    - (4) Simulated launch test
- 4. Support operations
  - a. Mission operations systems
  - b. Deep space network
  - c. Terminal heat sterilization

- 5. Launch criteria
- 6. Launch constraints
- 7. Scrub procedures and turnaround time
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1. Introduction 2. Scope and applicable documents 3. Range, safety data a. Flight reference b. Vehicle configuration c. Nominal and off-nominal trajectories d. Maximum velocity vector e. Turning angle vector f. Description of the thrust or flight termination and destruct system (1) Wiring diagrams (2) Photographs (3) Summary of test results to show destruct function reliability and confidence level	

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1. Introduction 2. Scope and applicable documents 3. Factors affecting pad safety a. Detailed information pertaining to ordnance items. b. Detailed information pertaining to pyrotechnics c. Detailed information pertaining to propellants d. Detailed information pertaining to compressed gases 4. Test requirements	

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b. Communications	
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4. Forecast of propellants  a. Types of propellants	
b. Schedule of propellant requirements	
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1	<ul><li>(b) Extent of JPL and contractor participation</li><li>(c) Test instrumentation required</li></ul>	

- b. Test procedures
  - (1) Use of other than Voyager equipment, systems or vehicles
  - (2) Plan for processing and handling of data obtained
  - (3) Data reduction requirements
    - (a) Use of Government data reduction facilities
- c. Propellant tanking procedures
- d. EMI control
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<ol> <li>Introduction</li> <li>Summary to include specific test objectives, test results, findings and conclusions, and recommendations. Details to be included in subsequent sections of the report.</li> <li>Subsystem performance testing</li> <li>System performance testing         <ul> <li>Objectives</li> <li>Results</li> <li>Findings and conclusions</li> <li>Intersystem performance testing</li> <li>LCE and support equipment evaluation</li> <li>Logistic supportability</li> </ul> </li> <li>Final telemetry calibration book</li> </ol>

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c. Assembly and test of spacecraft d. Final system test	
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D DRAWING		☐ CATALOG		LOG					
☐ FILM (STATIC OR MOTI	ON)	CONTRACT		MANU					
☐ ILLUSTRATION ☐ MODEL		DIRECTIVE			RANDUM	,			
☐ MODEL ☐ DISCLOSURE ☐ MINUTES ☐ RECORDING (TAPE OR DISC) ☐ ENGINEERING CHANGE ☐ PLAN			,,,,	APPLICABLE STAI	NDARDS:				
COMPUTER CARD		ORDER		PROC	EDURE				
COMPUTER TAPE		☐ REQUEST FOR E	NGINEER- 🗆	REGU	LATION	•			
☐ MICROFILM (W/OR W/	CARD)	ING CHANGE	ROPOSAL 🔯	REPOR	RT				
Ø OTHER TWX		☐ ENGINEERING C		SCHE					
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PAGE | OF 2

VOYAGER DATA REQUIREMENT DESCRIPTION - 2ND SHEET	
SPECIAL DISTRIBUTION: (IF DISTRIBUTION IS NOT COVERED BY AN EXISTING DDL WRITE IN DISTRIBUTION BELOW)	DRD NO.: AL-010
OUTLINE OF CONTENTS:  Daily TWX	
1. States work accomplished versus work planned a. Test complete b. Planned tests incomplete (1) Reason (2) If hardware problem - part number - serial number of part and serial number of end item that malfunctioned c. Open previous problems (1) Probable completion date (2) Accomplishment this date (3) Status	
(CONTINUE ON THIRD SHEET, IF NECESSARY, AND AFFIX TO THIS DRD.)	

#### DOCUMENTATION RELATIONSHIP TREES

A documentation relationship tree has been prepared to further develop the data base interrelationships by identifying and presenting pictorially the relationships of all Voyager contractor data items within each functional category and by showing their relationships across categories.

Relationships within the functional category are shown by constructing a tier pattern beginning with the top-level (or governing) data item and relating, in descending order, all data items within the category to this top-level data item. (The location of a data item at a given level on the diagram does not necessarily indicate the importance of that specific item but identifies and defines its relation to all other data items in that category.)

Relationships between data items in one category and data items in other functional categories are shown by (1) arrows to indicate the direction of the relationship, and (2) an alphabetic code to indicate the nature of the interrelationship as follows:

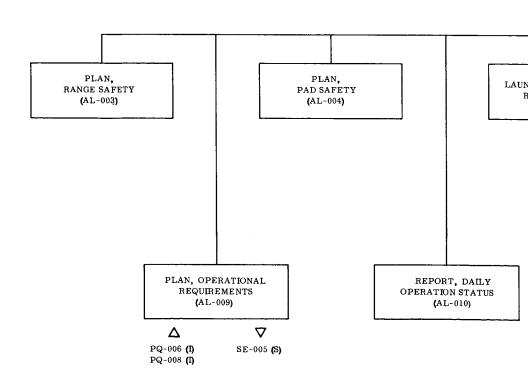
- a. Data items needed for preparation and/or support of the referenced item. (I)
- b. Data items supported or needed by this data item. (S)
- c. Data items that relate "to" and provide information of a general nature but are not required in an input or support role. (G)

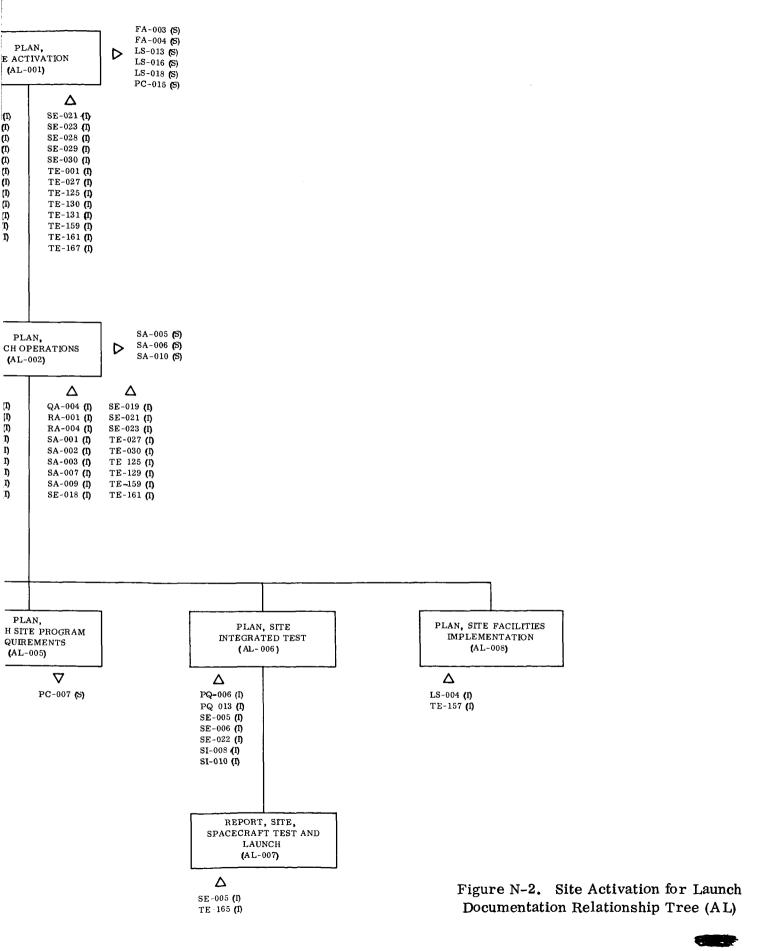
Each data item appearing on the Data Item List (DIL) was examined and evaluated with respect to its contribution to, or dependence on, data items appearing in other categories, and is included in the diagrams.

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AM-001 (I) MA-007
AM-003 (I) MA-008
AM-005 (I) MP-002
LS-004 (I) PQ-004
LS-006 (I) PQ-005
LS-009 (I) PQ-008
LS-010 (I) PQ-013
MA-001 (I) QA-003

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5-4

#### DATA ITEM PHASING/FREQUNECY

The Data Item Frequency and Phasing chart shows the requirements for contractor data item preparation by major project review periods. It is concerned with the phasing and frequency of preparation of each individual data item and not the total number of copies required for reproduction and distribution.

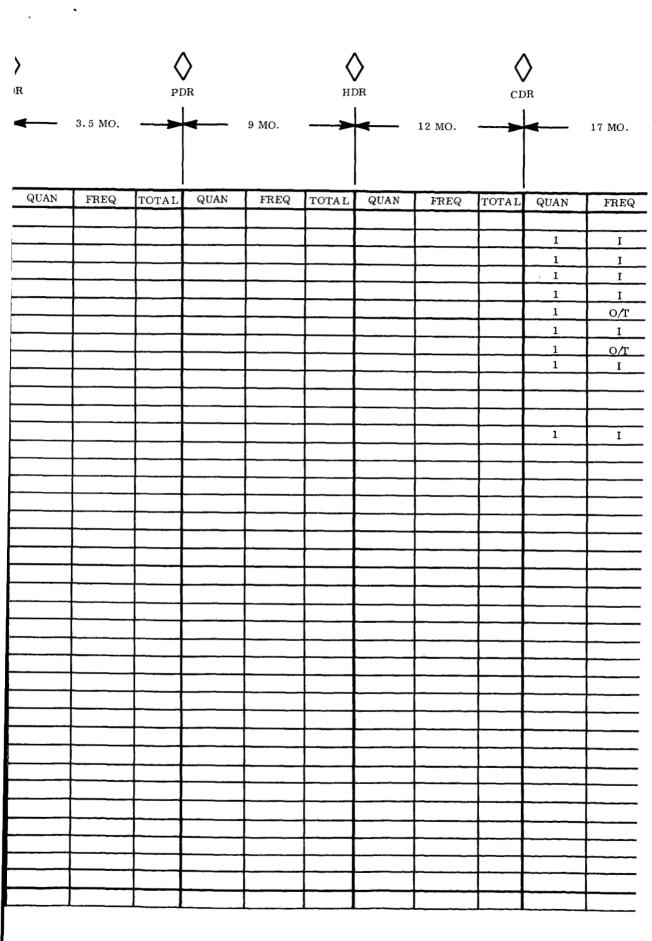
The following legend and/or abbreviations have been used:

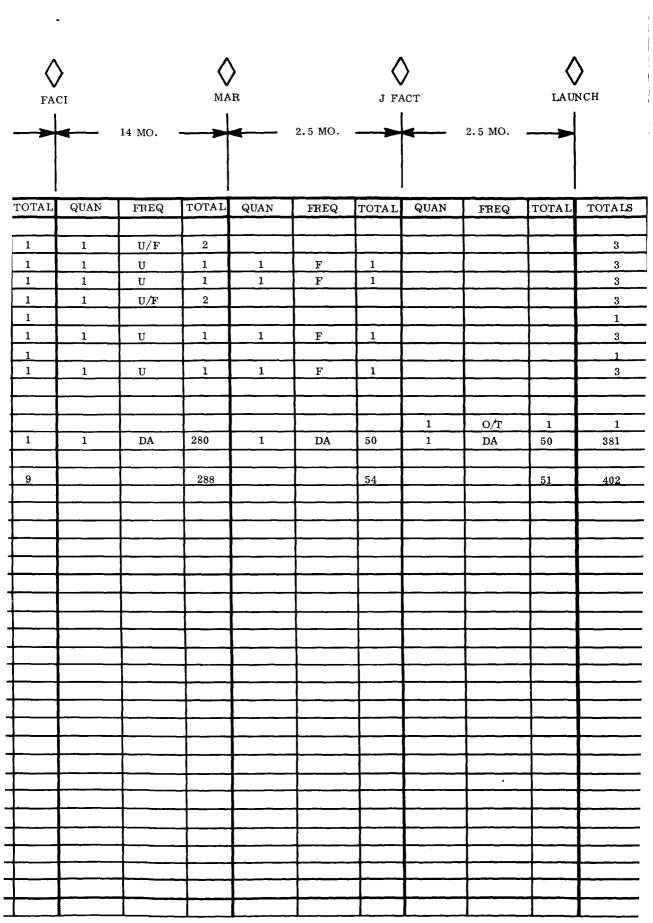
A	Annual	Q	Quarterly
S/A	Semiannual	I	Initial
WK	Weekly	F	Final
MO	Monthly	N/R	New and revised
B/W	Biweekly	SDR	System design review
B/M	Bimonthly	PDR	Preliminary design review
O/T	One time	HDR	Hard design review
A/R	As required	CDR	Critical design review
U	Update	FACI	First article configuration inspection
I/U	One update	MAR	Mission acceptance review
DA	Daily	JFACT	Joint flight acceptance Composite testing

3.5 MO.

#### DATA ITEM TITLE

	·			
SITE ACTIVATION FOR LAUNCH	QUAN	FREQ	TOTAL	
PLANS				
AL-001 Plan, Site Activation				
AL-002 Plan, Launch Operations				
AL-003 Plan, Range Safety				
AL-004 Plan, Pad Safety				
AL-005 Plan, Launch Site Program Requirements				
AL-006 Plan, Site Integrated Test				
AL-008 Plan, Site Facilities Implementation				
AL-009 Plan, Operational Requirements				
REPORTS				
AL-007 Report, Site, Spacecraft Test and Launch				
AL-010 *Report, Daily Operational Status	<u>L</u>			
TOTAL				
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*Key Informal Data				
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Figure N-3. Site Activation for Launch Data Item Phasing and Frequency Matrix